

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) In a device having an electrically powered motor and a motor control system for an the electrically powered motor having a motor control switch an On/Off switch for switching power to the motor when in an 'On' position, the motor control system having a controller for controlling operation of the motor, a method for preventing startup of a the motor when the motor device is initially electrically connected to a power source with the motor control On/Off switch in the 'On' position, comprising:

applying power to the controller when the device is initially electrically connected to the power source and utilizing the controller to fire an electronic switch to couple the motor to one side of the power source at a level insufficient for the motor to rotate;

determining with the controller whether the motor control On/Off switch is in the 'On' position while the controller is firing the electronic switch to couple the motor to one side of the power source at the level insufficient for the motor to rotate when the motor is initially electrically connected to the power source; and

utilizing the controller to disable normal operation of the motor when the controller determines that the motor control On/Off switch is in the 'On' position while the controller is firing the electronic switch to couple the motor to one side of the power source at the level insufficient for the motor to rotate when the motor is initially electrically connected to the power source.

2. (Original) The method of claim 1, wherein utilizing the controller to disable normal operation of the motor comprises utilizing the controller to disable normal operation of the motor until the controller determines the On/Off switch is in an Off position.

3. (Currently Amended) The method of claim 1, wherein utilizing a controller to determine the position of the ~~motor control~~ On/Off switch includes utilizing the controller to sense whether current is flowing through the motor.

4. (Currently Amended) The method of claim 1, wherein utilizing a controller to determine the position of the ~~motor control~~ On/Off switch comprises utilizing the controller to sense whether a voltage is applied to the motor.

5. (Original) The method of claim 1, wherein electrically connecting the motor to a power source comprises connecting the motor to an AC power source.

6. (Currently Amended) The method of claim 5, wherein utilizing the controller to fire the electronic switch to couple the motor to one side of the power source at the level insufficient for the motor to rotate ~~disable operation of the motor~~ includes utilizing the controller to fire ~~an~~ the electronic switch ~~that to~~ to couples the motor to a neutral of the AC power source at a low conduction angle such that power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate and utilizing the controller to disable normal operation of the motor includes utilizing the controller to continue to fire the electronic switch to couple the motor to a neutral of the AC power source at the low conduction angle after the controller determines that the On/Off switch was in the On position.

7. (Currently Amended) The method of claim 5, wherein utilizing the controller to fire the electronic switch to couple the motor to one side of the power source at a level insufficient for the motor to rotate ~~disable operation of the motor~~ includes utilizing the controller to fire ~~an~~ the electronic switch ~~that to~~ to couples the motor to a neutral of the AC power source at a low conduction angle ~~when the motor is initially electrically connected to the AC power source~~ such that power provided to the motor is

insufficient for the motor to rotate, the method further including utilizing the controller to sense zero crossing of the AC power and upon sensing a zero crossing of the AC power, utilizing the controller to determine whether the ~~motor control~~ On/Off switch is in the 'On' position.

8. (Currently Amended) The method of claim 7, wherein utilizing the controller to fire the electronic switch at the low conduction angle when the ~~motor device~~ is initially electrically connected to the AC power source includes utilizing the controller to fire the electronic switch at the low conduction angle when the controller senses zero crossing of the AC power.

9. (Currently Amended) The method of Claim 7, wherein utilizing the controller to disable normal operation of the motor comprises utilizing the controller to disable normal operation of the motor until the controller determines that the ~~motor control~~ On/Off switch is in an 'Off' position.

10. (Original) The method of claim 1, wherein electrically connecting the motor to a power source comprises electrically connecting the motor to a DC power source.

11. (Currently Amended) The method of Claim 10, wherein utilizing the controller to fire the electronic switch to couple the motor to one side of the power source at the level insufficient for the motor to operate ~~disable normal operation of the motor~~ includes utilizing the controller to switch an electronic switch that couples the motor to a common of the DC power source at a narrow duty cycle ~~when the motor is initially electrically connected to the DC power source~~, such that power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

12. (Original) The method of Claim 10, wherein utilizing the controller to disable normal operation of the motor comprises utilizing the controller to disable normal operation of the motor until the controller determines the On/Off switch is in an 'Off' position.

13. (Currently Amended) A system for preventing inadvertent startup of a motor when a device having the motor is initially electrically connected to a power source while the motor is in an 'On' operational status, the system comprising:

Aan On/Off ~~motor control~~ switch coupled between the motor and a first side of an electrical power source that switches electrical power to the motor;

an electronic switch coupled between the motor and a second side of the electrical power source; and

a controller configured to determine a position of the ~~motor control~~ On/Off switch when the motor is initially connected to the power source and disabling normal operation of the motor if the ~~motor control~~ On/Off switch is in a position switching electrical power to the motor when the motor is initially connected to the power source; and

a shunt resistor in series with the electronic switch and the second side of the electrical power source, wherein to determine the position of the On/Off switch, the controller is further configured to monitor voltage across the shunt resistor, thereby sensing whether current is flowing through the motor.

14 - 16 (Cancelled)

17. (Original) The system of Claim 13, wherein the motor is electrically connected to an AC power source.

18. (Currently Amended) The system of claim 17 wherein the controller is further configured to fire the electronic switch at a low conduction angle when the ~~motor device~~ device is initially connected to the AC power source such that the power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

19. (Currently Amended) The system of claim 17 wherein the controller is further configured to fire the electronic switch at a low conduction angle when the ~~motor device~~ device is initially connected to the AC power source such that the power provided to the

motor is insufficient for the motor to rotate, the controller further configured to sense zero crossing of the AC power and upon sensing a zero crossing of the AC power, determining whether the ~~motor control~~ On/Off switch is in the 'On' position.

20. (Original) The system of claim 19 wherein the controller is configured to fire the electronic switch at the low conduction angle when the motor is initially electrically connected to the AC power source by firing the electronic switch at the low conduction angle when the controller senses zero crossing of the AC power.

21. (Currently Amended) The system of Claim 17, wherein the controller is further configured to:

disable normal operation of the motor when the ~~motor control~~ On/Off switch is determined to be in a closed position switching power to the motor when the motor is initially connected to the AC power source; and

continue to disable normal operation of the motor until the controller determines that the ~~motor control~~ On/Off switch has been placed in an OFF position where it is not switching electrical power to the motor.

22. (Original) The system of Claim 13, wherein the motor is electrically connected to a DC power source.

23. (Original) The system of claim 22 wherein the controller is further configured to switch the electronic switch at a narrow duty cycle when the motor is initially connected to the DC power source, such that the power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

24. (Currently Amended) The system of Claim 22, wherein the controller is further configured to:

disable normal operation of the motor when the ~~motor control~~ On/Off switch is determined to be a closed position when the motor is initially connected to the DC power source; and

continue to disable normal operation of the motor until the controller determines that the ~~motor control~~ On/Off switch has been placed in an open position.

25. (Currently Amended) A power tool, comprising:

a motor circuit having an electric motor, an On/Off switch, and an electronic switch coupled in series between a hot side and a common side of an electric power source when the power tool is connected to the electrical power source ;

a controller electrically coupled to the motor circuit, the controller, upon the power tool being initially connected to the electrical power source, firing the electronic switch to couple power to the motor at a level insufficient for the motor to rotate; and

the controller, while firing the electronic switch to couple power to the motor at the level insufficient for the motor to function normally, sensing that ~~senses~~ whether the On/Off switch is in an 'On' position where it is switching electrical power to the motor when the power tool is initially connected to the electrical power source and disabling normal operation of the motor upon sensing that the On/Off switch is in the 'On' position when the power tool is initially connected to the electrical power source, the controller continuing to disable normal operation of the motor while firing the electronic switch to couple power to the motor at the level insufficient for the motor to rotate until the controller senses that the On/Off switch has been switched to an 'Off' position and operating the motor in normal operation once the On/Off switch is switched to the 'On' position after it has been switched to the 'Off' position.

26. (Original) The power tool of claim 25 wherein the motor circuit includes a shunt resistor connected in series with the motor and the electrical power source, the controller electrically coupled to the shunt resistor and sensing whether current is flowing therethrough, the controller sensing that the On/Off switch is in the 'On' position upon sensing that current is flowing through the shunt resistor.

27. (Currently Amended) The power tool of claim 26 wherein the electric power source is a source of AC power, the controller firing the electronic switch at a low

conduction angle when the power tool is initially connected to the AC power source ~~such that power provided to the motor is~~ to couple power to the motor at the level insufficient for the motor to function normally, the controller sensing zero crossing of the AC power once the power tool is initially connected to the AC power source and sensing whether current is flowing through the shunt resistor once it has sensed the zero crossing of the AC.

28. (Original) The power tool of claim 27 wherein the controller fires the electronic switch at a low conduction angle such that the power provided to the motor is sufficient to make the motor hum but insufficient for the motor to rotate.

29. (Original) The power tool of claim 27 wherein the controller fires the electronic switch at the low conduction angle upon sensing zero crossing of the AC power.

30. (Currently Amended) The power tool of claim 26 wherein the electric power source is a source of DC power, the controller firing the electronic switch at a low duty cycle when the power tool is initially connected to the DC power source to couple power to the motor at the level ~~such that power provided to the motor is~~ insufficient for the motor to function normally.

31. (Original) The power tool of claim 30 wherein the controller fires the electronic switch at a low duty cycle such that the power provided to the motor is sufficient to make the motor hum but insufficient for the motor to rotate.

32. (Currently Amended) The power tool of claim 26 wherein the ~~motor control~~ On/Off switch is coupled between a first side of the motor and the hot side of the electrical power, a first side of the electronic switch coupled to a second side of the motor, and the shunt resistor coupling a second side of the electronic switch to the common side of the electrical power source.

33. (Original) The power tool of claim 25 wherein the controller is electrically coupled to the motor circuit to sense whether voltage is applied to the motor

when the power tool is initially connected to the source of electrical power and sensing whether the 'On/Off' switch is in the 'On' position upon sensing that voltage is applied to the motor.

34. (Currently Amended) The power tool of claim 25 wherein the ~~motor control~~ On/Off switch is connected between a first side of the motor and the hot side of the electrical power source, and the electronic switch is connected between a second side of the motor and the common side of the electrical power source, the controller electrically coupled to at least one of a junction between the first side of the motor and the ~~motor control~~ On/Off switch and a junction between the second side of the motor and the electronic switch.

35. (Original) The power tool of claim 34 wherein the controller is electrically coupled to the at least one junction by an amplifier.

36. (Original) The power tool of claim 34 wherein the controller is electrically coupled to the at least one junction by at least one resistor.

37. (Original) The power tool of claim 34 wherein the electronic switch is coupled to the common side of the electric power source through a shunt resistor.

38. (Original) The power tool of claim 34 wherein the electric power source is a source of AC power, the controller firing the electronic switch at a low conduction angle upon sensing that the On/Off switch is in the 'On' position when the power tool is initially connected to the AC power source such that power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

39. (Original) The power tool of claim 34 wherein the electric power source is a source of DC power, the controller firing the electronic switch at a low duty cycle upon sensing that the On/Off switch is in the 'On' position when the power tool is initially connected to the DC power source such that power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

40. (Currently Amended) A method of preventing inadvertent startup of a motor of a power tool when the power tool is initially connected to an electric power source, the motor connected in a motor circuit in series with an On/Off switch and an electronic switch, the method comprising upon the power tool being initially connected to the electric power source firing the electronic switch to couple power to the motor at a level insufficient for the motor to function normally, sensing whether the On/Off switch is in an 'On' position when the power tool is initially connected to the electric power source while firing the electronic switch to couple power to the motor at the level insufficient for the motor to function normally, and upon sensing that the On/Off switch is in the 'On' position when the power tool is initially connected to the electric power source, disabling normal operation of the motor until the On/Off switch is switched to an 'Off' position and operating the motor normally upon the On/Off switch being switched to the 'On' position after having been switched to the 'Off' position.

41. (Original) The method of claim 40 wherein the power tool includes a controller electrically coupled to the motor circuit and sensing whether the 'On/Off' switch is in the 'On' position when the power tool is initially connected to the electric power sources includes utilizing the controller to sense whether at least one of current is flowing through the motor circuit and voltage is applied to the motor.

42. (Currently Amended) In a motor control system for an electrically powered motor having ~~a motor control~~ On/Off switch for switching power to the motor when in an 'On' position, the motor control system having a controller for controlling operation of the motor, a method for preventing startup of a motor when a device having the motor is initially electrically connected to ~~a AC~~ power source with the ~~motor control~~ On/Off switch in the 'On' position, comprising:

~~determining with the controller whether the motor control switch is in the 'On' position when the motor is initially electrically connected to the power source by utilizing the controller to sense whether a voltage is applied to the motor~~ utilizing the controller to fire an electronic switch that couples the motor to a neutral of the AC power source at a low conduction angle when the motor is initially electrically connected to the

AC power source such that power provided to the motor is insufficient for the motor to rotate;

utilizing the controller to sense zero crossing of the AC power and upon sensing a zero crossing of the AC power, utilizing the controller to determine whether the On/Off switch is in the 'On' position; and

utilizing the controller to disable normal operation of the motor when the controller determines that the ~~motor control~~ On/Off switch is in the 'On' position when the motor is initially electrically connected to the power source.

43. (Previously Presented) The method of claim 42, wherein utilizing the controller to disable normal operation of the motor comprises utilizing the controller to disable normal operation of the motor until the controller determines the On/Off switch is in an Off position.

44, 45. (Cancelled)

46. (Currently Amended) The method of claim ~~45~~42, wherein utilizing the controller to fire the electronic switch at the low conduction angle when the motor is initially electrically connected to the AC power source includes utilizing the controller to fire the electronic switch at the low conduction angle when the controller senses zero crossing of the AC power.

47. (Currently Amended) The method of Claim ~~45~~42, wherein utilizing the controller to disable normal operation of the motor comprises utilizing the controller to disable normal operation of the motor until the controller determines that the ~~motor control~~ On/Off switch is in an 'Off' position.

48, 49. (Cancelled)

50. (Currently Amended) A system for preventing inadvertent startup of a motor when a device having the motor is initially electrically connected to ~~aan~~ an AC power source while the motor is in an 'On' operational status, the system comprising:

~~a motor control~~ an On/Off switch coupled between the motor and a first side of an electrical power source that switches electrical power to the motor;

an electronic switch coupled between the motor and a second side of the electrical power source;

a controller configured to fire the electronic switch at a low conduction angle when the device having the motor is initially connected to the AC power source such that the power provided to the motor is insufficient for the motor to rotate, the controller further configured to sense zero crossing of the AC power and upon sensing a zero crossing of the AC power, determining whether the On/Off switch is in the 'On' position and to disable to determine a position of the motor control switch when the motor is initially connected to the power source and disabling normal operation of the motor if the motor control On/Off switch is in a position switching electrical power to the motor when the motor is initially connected to the power source; and

a shunt resistor, wherein to determine the position of the ~~motor control~~ On/Off switch, the controller is further configured to monitor voltage across the shunt resistor, thereby sensing whether current is flowing through the motor.

51. (Currently Amended) The system of Claim 50, wherein ~~the motor is electrically connected to an AC power source and when~~ the controller is further configured to fire fires the electronic switch at a the low conduction angle ~~when the motor is initially connected to the AC power source it does so~~ such that the power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

52. (Cancelled)

53. (Currently Amended) The system of claim ~~52~~50 wherein the controller is configured to fire the electronic switch at the low conduction angle ~~when the motor is initially electrically connected to the AC power source by firing the electronic switch at~~ the low conduction angle when the controller senses zero crossing of the AC power.

54. (Currently Amended) The system of Claim 50, wherein ~~the motor is electrically connected to an AC power source and~~ the controller is further configured to:

disable normal operation of the motor when the ~~motor control~~ On/Off switch is determined to be in a closed position switching power to the motor when the device having the motor is initially connected to the AC power source; and

continue to disable normal operation of the motor until the controller determines that the ~~motor control~~ On/Off switch has been placed in an OFF position where it is not switching electrical power to the motor.

55, 56 . (Cancelled)

57. (Currently Amended) A system for preventing inadvertent startup of a motor when a device having the motor is initially electrically connected to ~~a~~ an AC power source while the motor is in an 'On' operational status, the system comprising:

~~a motor control~~ an On/Off switch coupled between the motor and a first side of an electrical power source that switches electrical power to the motor;

an electronic switch coupled between the motor and a second side of the electrical power source;

a controller configured to:

fire the electronic switch at a low conduction angle when the device having the motor is initially connected to the AC power source such that the power provided to the motor is insufficient for the motor to rotate, the controller further configured to sense zero crossing of the AC power and upon sensing a zero crossing of the AC power, determining whether the On/Off switch is in the 'On' position; and

~~determine a position of the motor control switch when the motor is initially connected to the power source by determining whether voltage is applied to the motor; and~~

~~disable normal operation of the motor if the motor control On/Off switch is in a position switching electrical power to the motor when the device having the motor is initially connected to the AC power source.~~

58. (Currently Amended) The system of Claim 57, wherein ~~the motor is electrically connected to an AC power source and the controller is further configured to fire~~ when the controller fires the electronic switch at a the low conduction angle ~~when the motor is initially connected to the AC power source~~ such that the power provided to the motor is sufficient for the motor to hum but insufficient for the motor to rotate.

59. (Cancelled)

60. (Currently Amended) The system of claim ~~59~~57 wherein the controller is configured to fire the electronic switch at the low conduction angle when the motor is initially electrically connected to the AC power source by firing the electronic switch at the low conduction angle when the controller senses zero crossing of the AC power.

61. (Currently Amended) The system of Claim 57, wherein ~~the motor is electrically connected to an AC power source and the controller is further configured to:~~

~~disable normal operation of the motor when the motor control switch is determined to be in a closed position switching power to the motor when the motor is initially connected to the AC power source; and~~

~~continue to disable normal operation of the motor until the controller determines that the motor control On/Off switch has been placed in an OFF position where it is not switching electrical power to the motor.~~

62 - 69. (Cancelled)